
Critique No.: CR-CA-2005-0007

Date of Critique: October 15, 2005

Critique Leader: Joel Scott

Meeting Participants: (individual discussions held, no group meetings) D. Bastedo, A. Pendzick, T. Nehring, J. Meier

Brief Event Description: On Friday October 14, 2005 two fire alarms were caused by water intrusion from rain water leakage into panels. The first fire was at 10:56 in 912-target-area and fire group responded to a manual pull station alarm, the roll up door control and a breaker for welding outlets were found as the source of the smoke. The second fire was in 912 EBBA area at 1531, fire group responded to the manual pull station alarm, the fire and smoke was from the roll up door controls.

RELEVANT FACTS AND DATA ASSOCIATED WITH THE EVENT: Investigation of both fires made it evident that water from both the roof and water running down cables intruded into these control boxes and caused shorts. The entire outside wall of 912 target building was leaking water from the heavy rain. In the rest of 912 many areas of rain leakage were noted. Also noted was that cable trays in some areas that penetrate building walls from outside had water running down cables to numerous panels. Several door controls and panels were de-energized to ensure no further problems would occur.

Sequence of events:

At 1056 on 10-14-05 the C-AD electricians were working on the cybrex UPS in 912 target area and initiated a manual pull box alarm on smelling and seeing smoke in the area. Fire group responded to area and after a thorough search by fire personnel and C-A personnel it was discovered that the roll up door controls and a breaker panel for welding outlets showed signs of burning. These panels were de-energized and LOTO. It was apparent that the shorted panels had water leaking in from roof leaks during heavy rain. This short probably caused or was part of cause for problems with the cybrex UPS.

At 1531 the Health Physics technicians noted smoke coming from the roll up door control panel in 912 EBBA and pulled the manual pull box alarm. Fire rescue and C-AD personnel arrived at scene and fire was out. The panel was secured and LOTO. C-AD personnel walked down the rest of 912 and had electricians de-energize two other roll up door controls, and several panels that had water leaking on them from both roof leaks and water running down cables in cable trays from outside.

ANALYSIS OF RELEVANT FACTS AND DATA:

Causal Factor:

1. Eight days of heavy rain, clogged roof drains and damaged flashing on the 912 roofs allowed water leakage to drain directly and indirectly into many electrical control panels that overheated from water caused shorts.
2. If the roof leaks were not bad enough many cable tray penetrations through building walls from outside had water running down cables into panels.

Recommended Corrective Actions:

1. Repair of all roofs is a priority BNL has to put resources into. For 912 a minimum of repairing the roof edges would remove the major leaks at building peripheries where 95% of the electrical panels are located.
2. All cable trays penetrating building should be sealed or angled upward into building so water can't use these runs as a way into building.
3. A review of all power and panels into 912 and target building should be performed to remove unneeded panels and wiring or to de-energize them at a minimum.
4. If it's not financially feasible to repair roofs, panels inside 912 should be changed to meet requirements for outdoor installation.

Lessons Learned:

Facility maintenance and upkeep needs a higher priority by BNL.

Signature:

Joel Scott
Critique Leader

October 16, 2005